# Intro

A bit of a foreword. Since I didn’t notice the third page of the PDF, I didn’t know that there is a need in a design document, before I start executing the actual assignment. Therefore, I am writing my design document in a retrospective.

# Process/Idea overview

After reading the assignment I started ideating on the possible solution for the given task. I usually use the design cycle when working on my tasks and this one was not an exception. Design cycle has four stages: Research ->Concept -> Solution -> Iteration. In this document I will explain only first three elements of the cycle since the iteration is pending to be performed after assessment.

## Research

There were several problems that I had to research. Most of the answers I knew already, but it’s a good practice to research those topics anyway. Who knows maybe there is a better solution.

The list that you see below is the list of questions that I was researching, with sub-points representing the snowball research:

* How to get JSON file from a URL? (I did this in the past, but unity has a new Networking system now, so I needed a reminder)
* How to extract data from JSON file? (No better solutions here)
* Hexagonal grid in Unity
  + Tilemaps tool with 3D hexagonal grid
  + Cube coordinates for hexagonal grid
* Spiral pattern on hexagonal grid

## 1.2 Concept

During the concepting phase I had to make several decisions in term of the solution’s design. I didn’t have to use the hexagonal grid and could have just made a function that generates a list of In-world coordinates in a spiral pattern, but there were several reasons for why I went for that (certainly more challenging) approach. First, modularity, with a grid system I could easily use another pattern of hexes appearing, perform distance calculations, or other coordinate manipulations. I consider this not a violation of YAGNI principle, since this solution might be used for other projects. Second reason is that I stumbled upon the so called “cube coordinates”, which I consider an opportunity to gain a new mathematical skill. Since this is test assignment and I don’t know if I will be accepted or not, then I need to have at least something out this all 😊.

After I made all the design decisions it was time to create the architecture of the solution. I rarely use UML because I think thought it’s a bit of an overkill for such a small assignment.

I thought that my system would consist of a utility layer where the JSON data will be retrieved form the URL. The Hexagonal grid manager would get the data from the utility layer and generate the pattern in cubic coordinates, in this case clockwork spiral pattern. After that the same manager would instantiate the hex prefabs in the world coordinates in sequence parsing them the data that they need (base color, on click color) and giving them the callback action, in case they were clicked. This would allow me to keep the Hexes and the Hexagonal Grid manager independent from each other. At last, there is a Raycast script which would invoke an OnClick method on each Hex in case it was clicked. To make things look smooth I decided that color and Hex positions will be controlled via Coroutines.

## Solution

After that I started execution. Not much I can say about it. Overall, everything was just as intended and I had only 4 bugs over the entire development course (Well, at least the ones I managed to record). There were some design changes on the fly, like using async /await instead of coroutines to get the JSON from the URL, but apart from that everything went smooth.

# Solution overview

In the end I have a solution that checks all the point in the assignment sheet. I didn’t use any external packages, since they were no good uses for them.